READ IMAGE DATA

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CHANNEL MIXER CIRCUIT

PIXEL CLOCK PE A/D CONVERTER CIRCUIT A/D CONVERTER CIRCUIT A/D CLOCK NAD AMPLIFIER CIRCUIT AMPLIFIER CIRCUIT TIMING SIGNAL GENERATOR CIRCUIT SAMPLE-HOLD PULSE NSH ADJUSTED SAMPLE-HOLD PULSE SAMPLE-HOLD CIRCUIT SAMPLE-HOLD CIRCUIT PHASE CONTROL CIRCUIT ADJUSTED RESET PULSE RESET ≜ PULSE NRS SHIFT PULSE SF CCD SENSOR TRANSFER CLOCK NTR ဖ

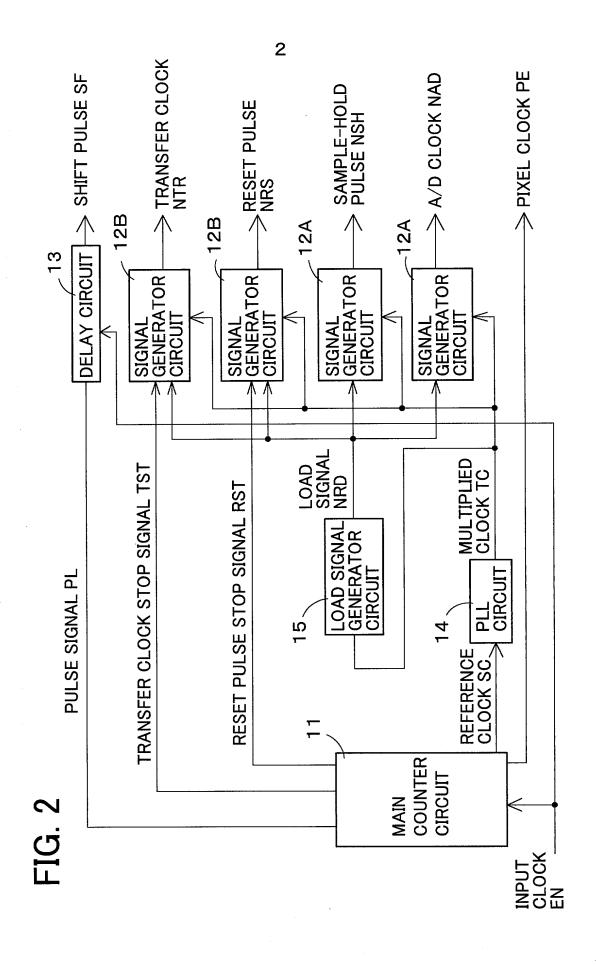
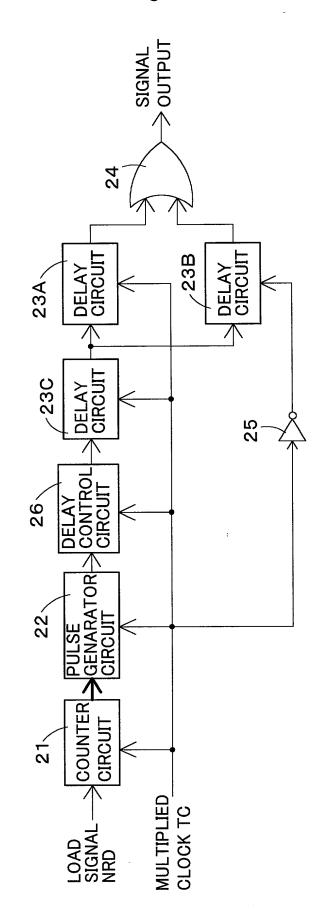


FIG. 3



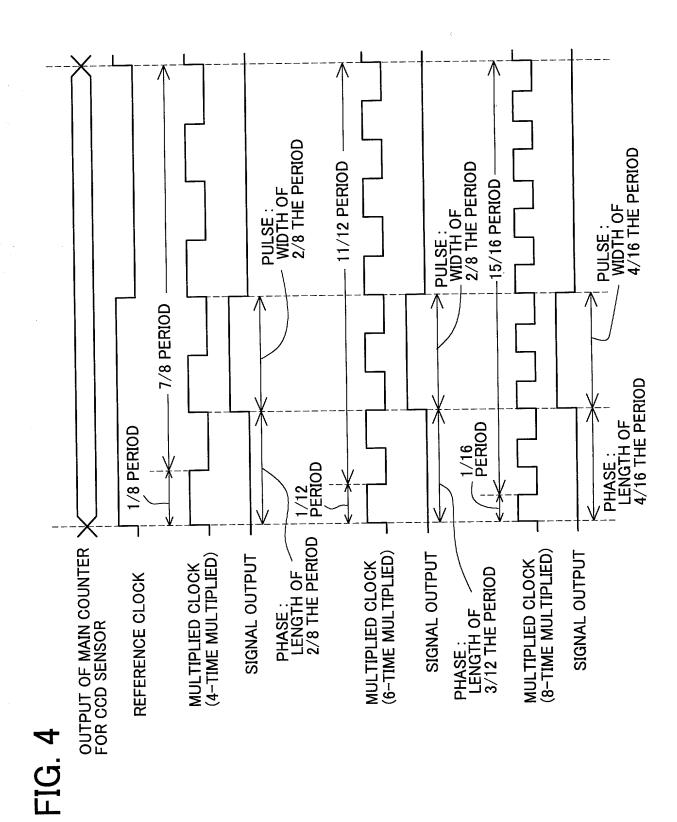
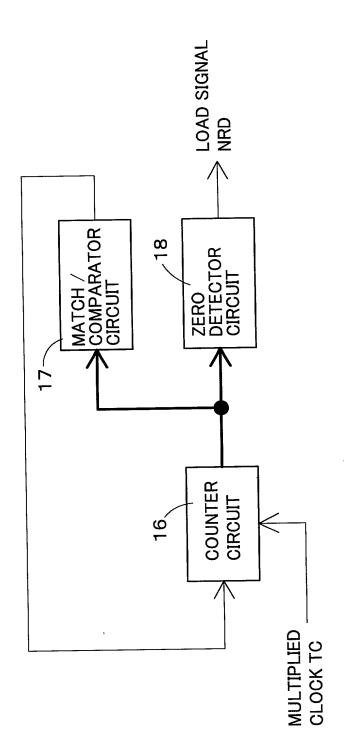


FIG. 5



### FIG. 6

### RELATIONSHIP BETWEEN PHASE SETTING AND LOAD VALUE SETTING

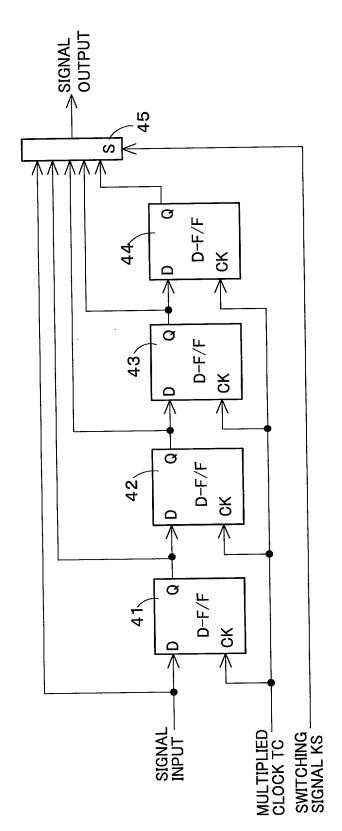
| PHASE LENGTH   | LOAD<br>VALUE |
|--|---------------|
| LENGTH OF 0/8~1/8 THE PERIOD  LENGTH OF 0/12~1/12 THE PERIOD  LENGTH OF 0/16~1/16 THE PERIOD     | 0             |
| LENGTH OF 2/16~3/16 THE PERIOD   | 7             |
| LENGTH OF 4/16~5/16 THE PERIOD   | 6             |
| LENGTH OF 2/12~3/12 THE PERIOD LENGTH OF 6/16~7/16 THE PERIOD                                    | 5             |
| LENGTH OF 4/12~5/12 THE PERIOD LENGTH OF 8/16~9/16 THE PERIOD                                    | 4             |
| LENGTH OF 2/8~3/8 THE PERIOD LENGTH OF 6/12~7/12 THE PERIOD LENGTH OF 10/16~11/16 THE PERIOD     | 3             |
| LENGTH OF 4/8~5/8 THE PERIOD LENGTH OF 8/12~9/12 THE PERIOD LENGTH OF 12/16~13/16 THE PERIOD     | 2             |
| LENGTH OF 6/8~7/8 THE PERIOD  LENGTH OF 10/12~11/12 THE PERIOD  LENGTH OF 14/16~15/16 THE PERIOD | 1             |

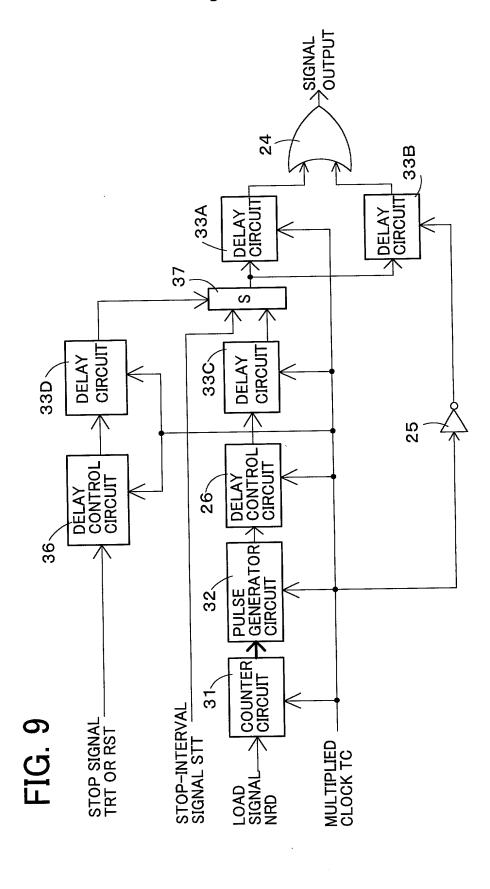
FIG. 7

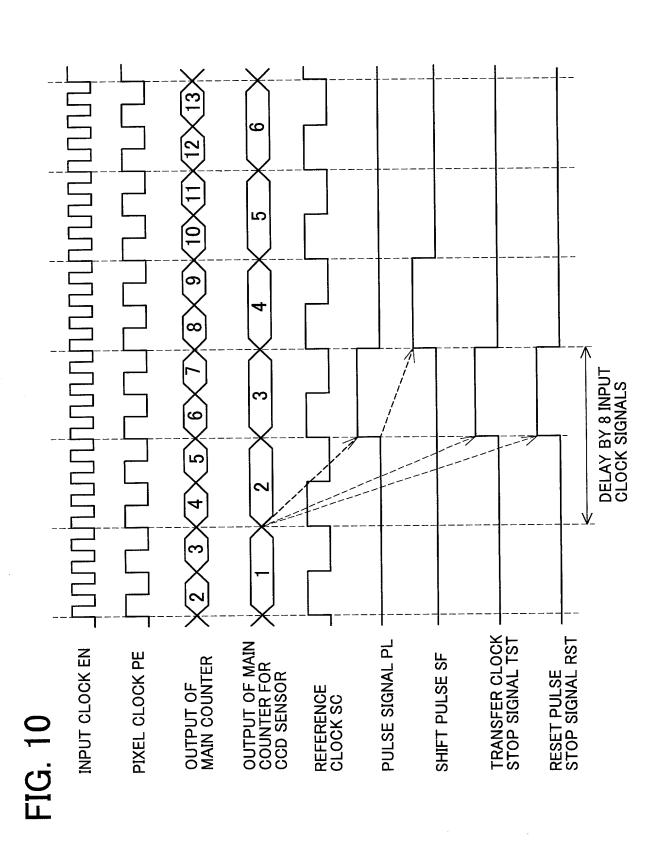
RELATIONSHIP BETWEEN PULSE WIDTH SETTING AND COMPARATIVE VALUE SETTING

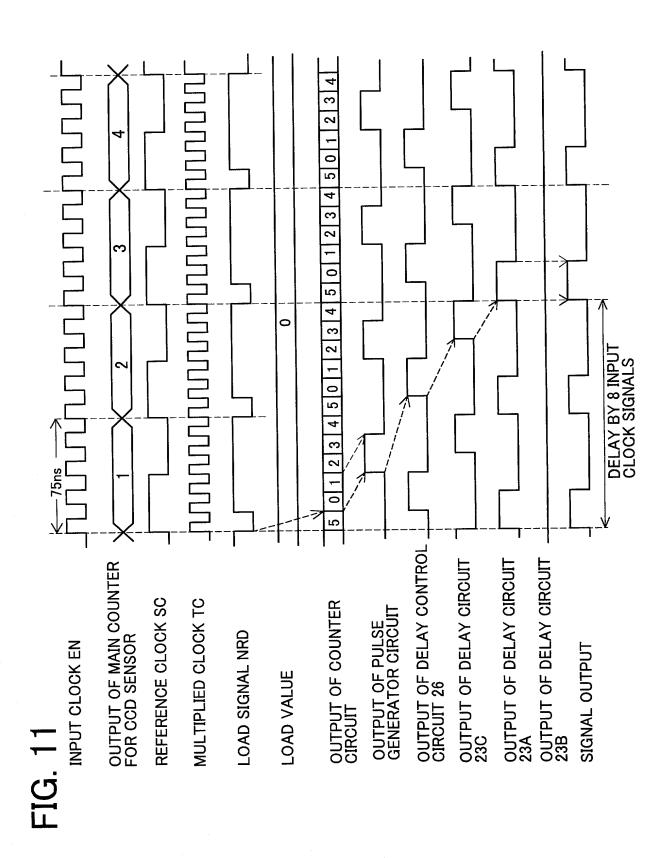
| PULSE WIDTH   | COMPARATIVE<br>VALUE |
|---|----------------------|
| WIDTH OF 2/8~3/8 THE PERIOD WIDTH OF 2/12~3/12 THE PERIOD WIDTH OF 2/16~3/16 THE PERIOD | 1                    |
| WIDTH OF 4/8~5/8 THE PERIOD WIDTH OF 4/12~5/12 THE PERIOD WIDTH OF 4/16~5/16 THE PERIOD | 2                    |
| WIDTH OF 6/8~7/8 THE PERIOD WIDTH OF 6/12~7/12 THE PERIOD WIDTH OF 6/16~7/16 THE PERIOD | 3                    |
| WIDTH OF 8/12~9/12 THE PERIOD WIDTH OF 8/16~9/16 THE PERIOD                             | 4                    |
| WIDTH OF 10/12~11/12 THE PERIOD WIDTH OF 10/16~11/16 THE PERIOD                         | 5                    |
| WIDTH OF 12/16~13/16 THE PERIOD   | 6                    |
| WIDTH OF 12/16~15/16 THE PERIOD   | 7                    |

FIG. 8

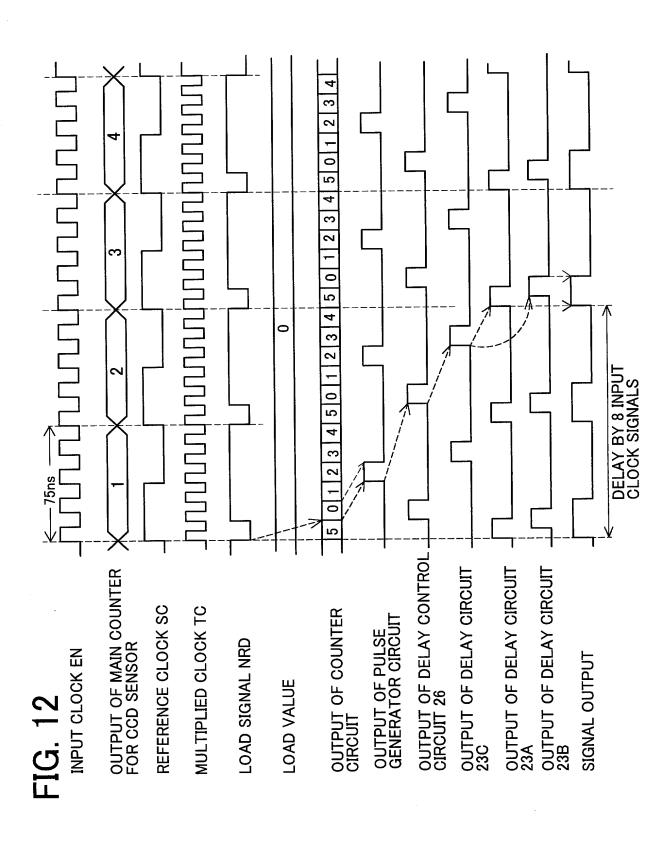


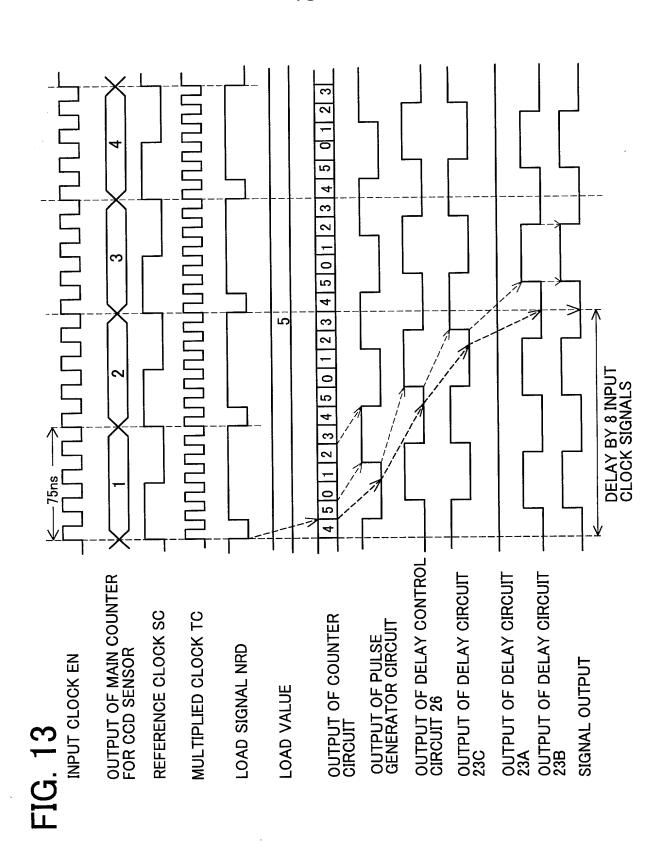


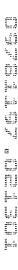


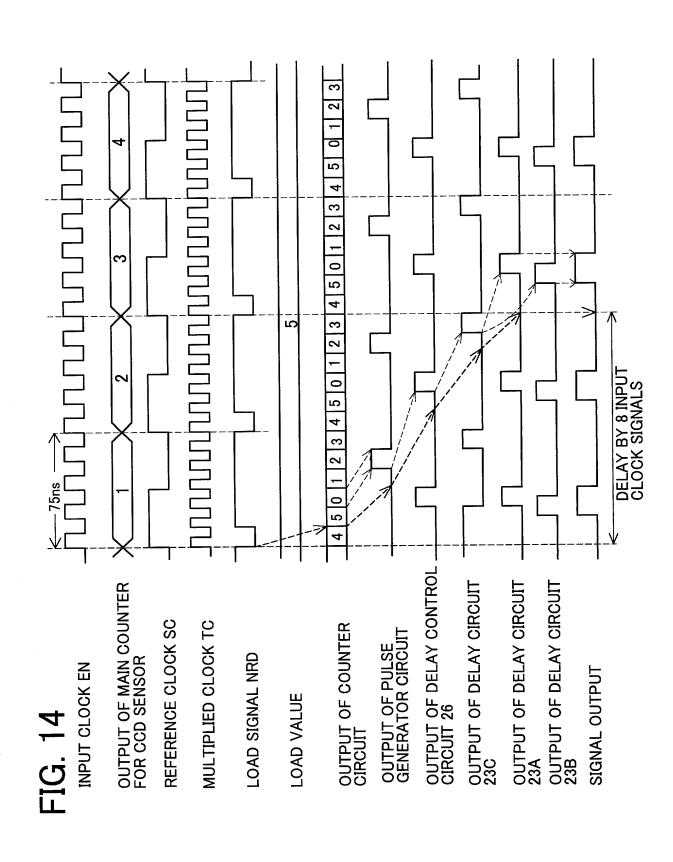












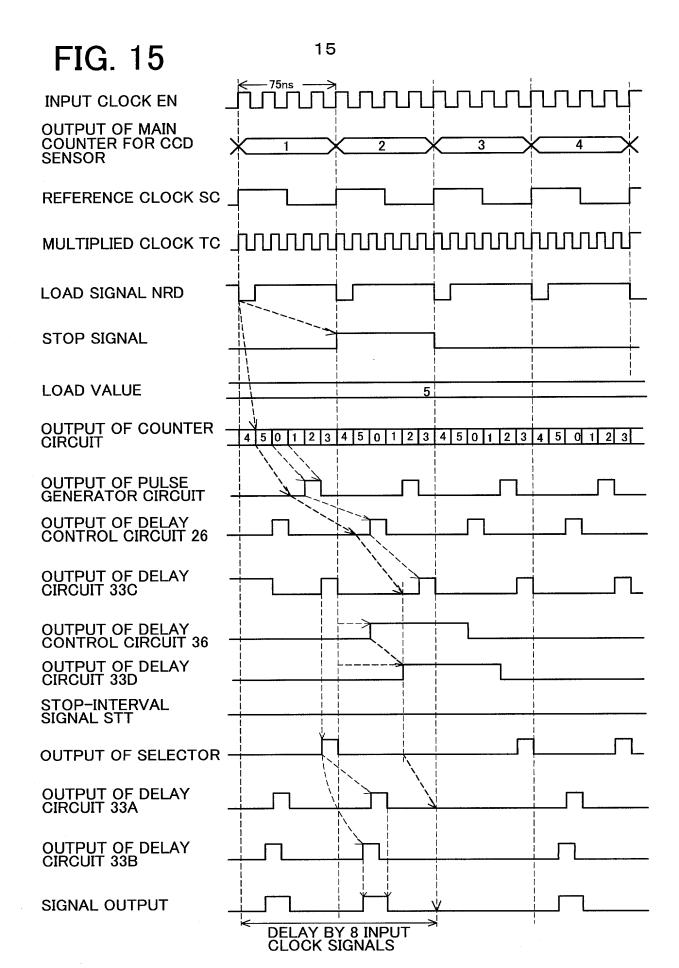


FIG. 16 PRIOR ART

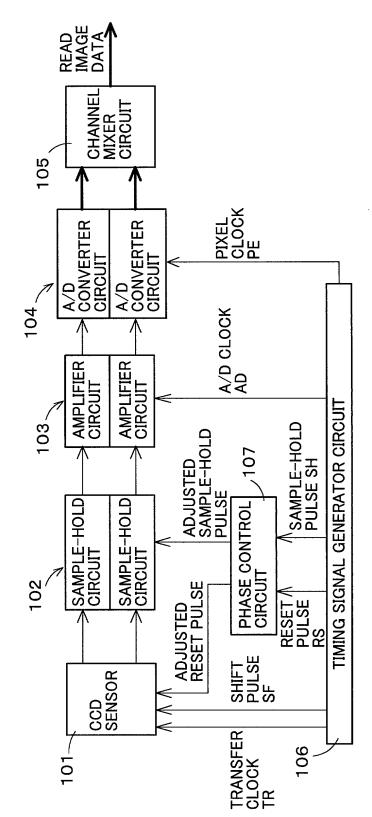


FIG. 17 PRIOR ART

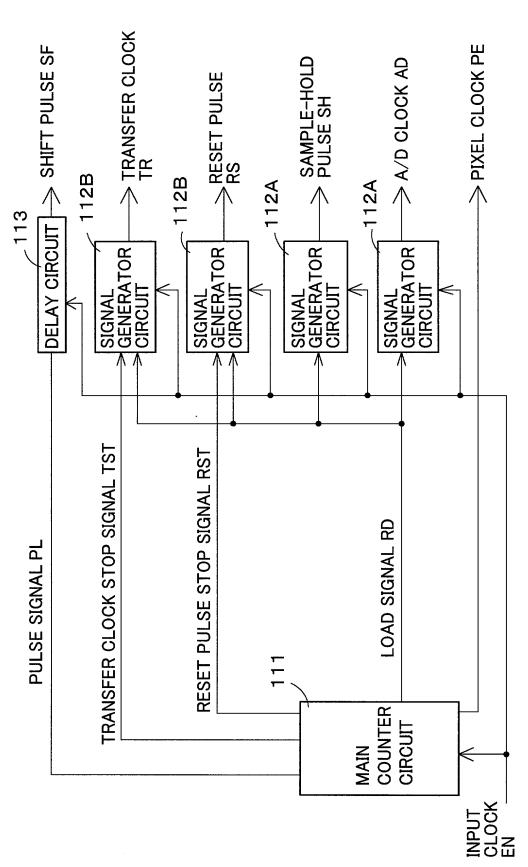
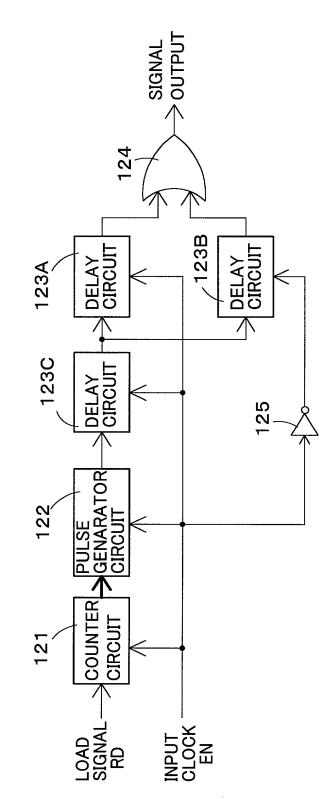


FIG. 18 PRIOR ART



PULSE: WIDTH OF 3/8 THE PERIOD 8/8 PERIOD 1/8 PERIOD PHASE: LENGTH OF 3/8 THE PERIOD **PRIOR ART** 50% DUTY TRANSFER CLOCK OUTPUT OF MAIN COUNTER FOR CCD SENSOR SIGNAL OUTPUT INPUT CLOCK FIG. 19

## FIG. 20 PRIOR ART

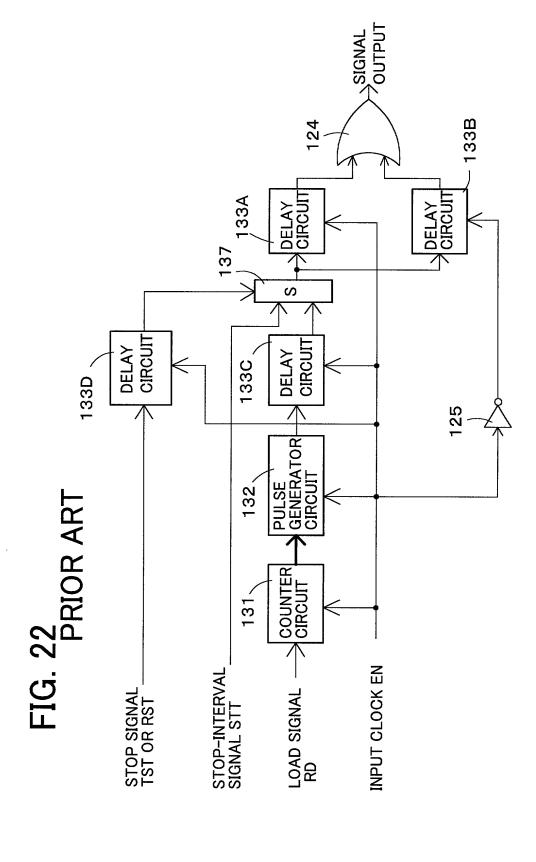
### RELATIONSHIP BETWEEN PHASE SETTING AND LOAD VALUE SETTING

| PHASE LENGTH                 | LOAD<br>VALUE |
|------------------------------|---------------|
| LENGTH OF 0/8~1/8 THE PERIOD | 0             |
| LENGTH OF 2/8~3/8 THE PERIOD | 3             |
| LENGTH OF 4/8~5/8 THE PERIOD | 2             |
| LENGTH OF 6/8~7/8 THE PERIOD | 1             |

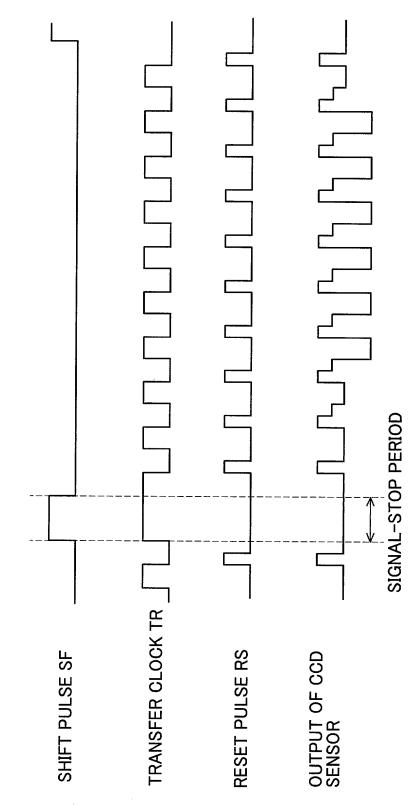
# FIG. 21 PRIOR ART

#### RELATIONSHIP BETWEEN PULSE WIDTH SETTING AND COMPARATIVE VALUE SETTING

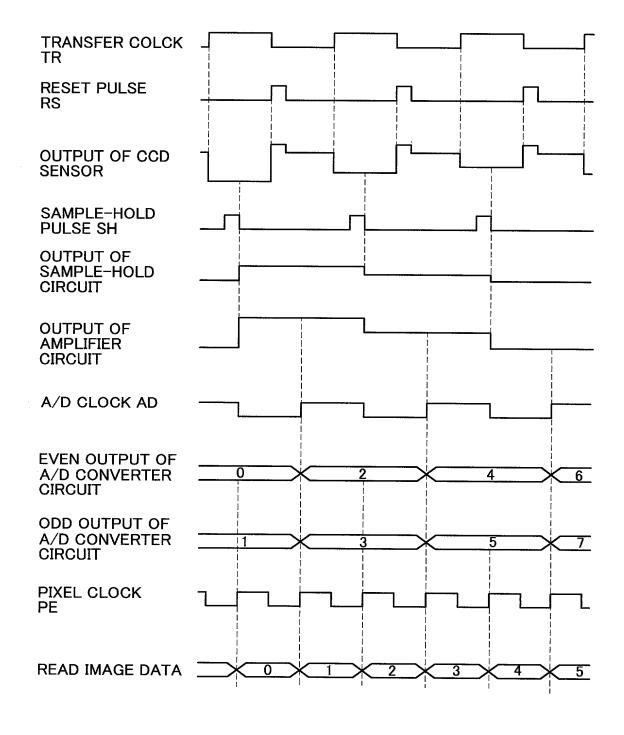
| PULSE WIDTH                 | COMPARATIVE<br>VALUE |
|-----------------------------|----------------------|
| WIDTH OF 2/8∼3/8 THE PERIOD | 1                    |
| WIDTH OF 4/8∼5/8 THE PERIOD | 2                    |
| WIDTH OF 6/8~7/8 THE PERIOD | 3                    |

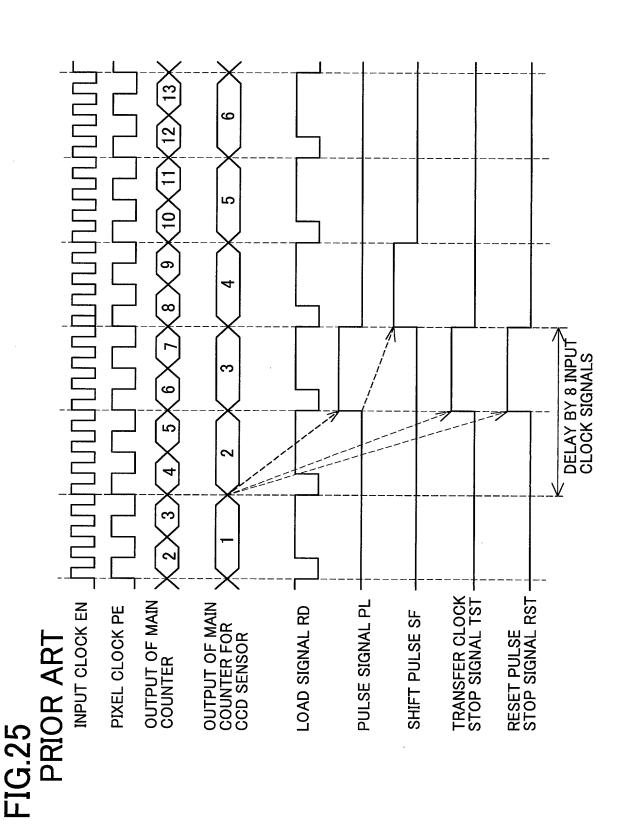




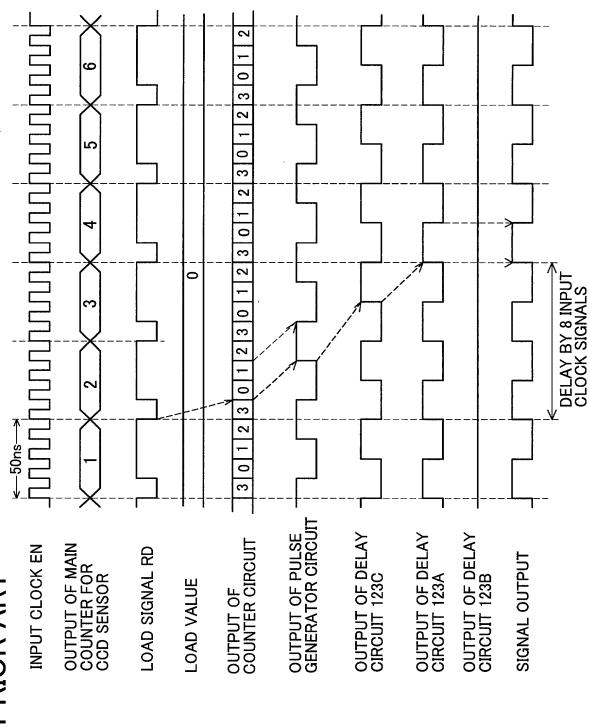


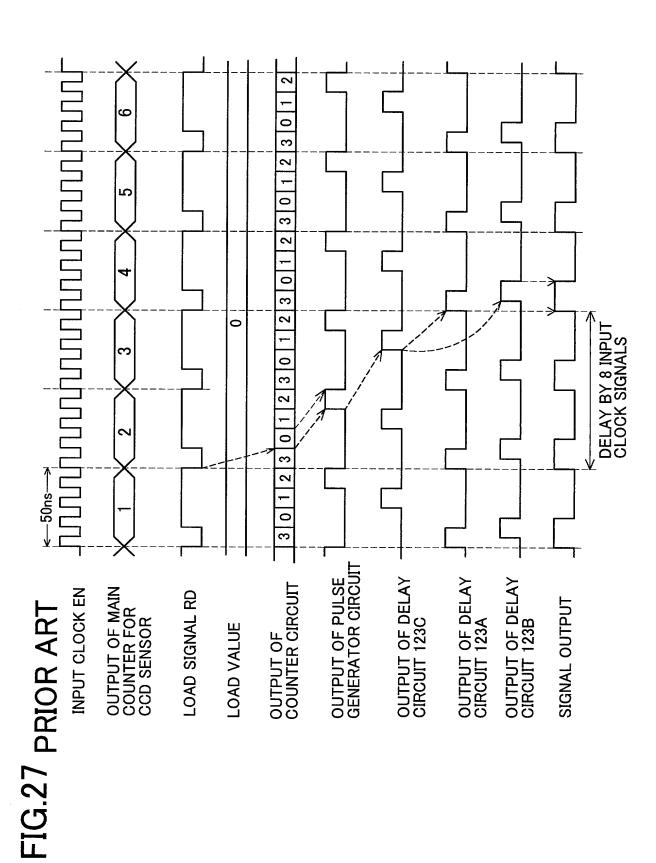
#### FIG. 24 PRIOR ART

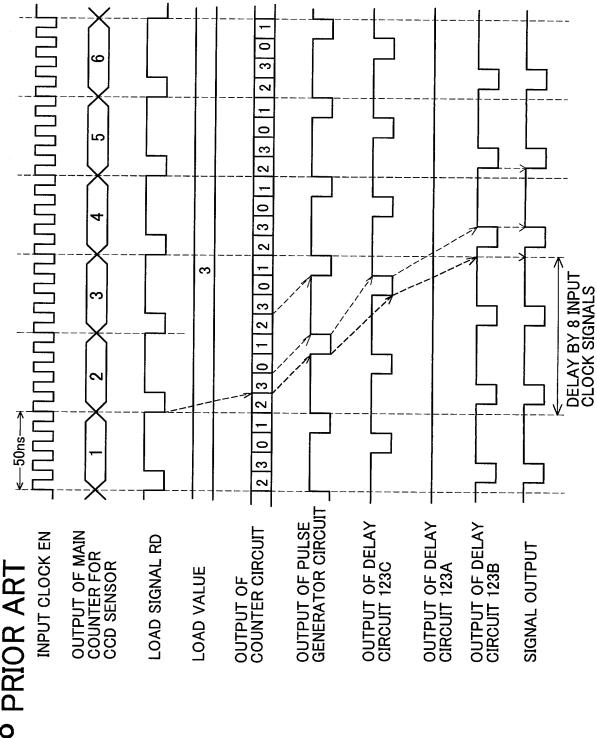




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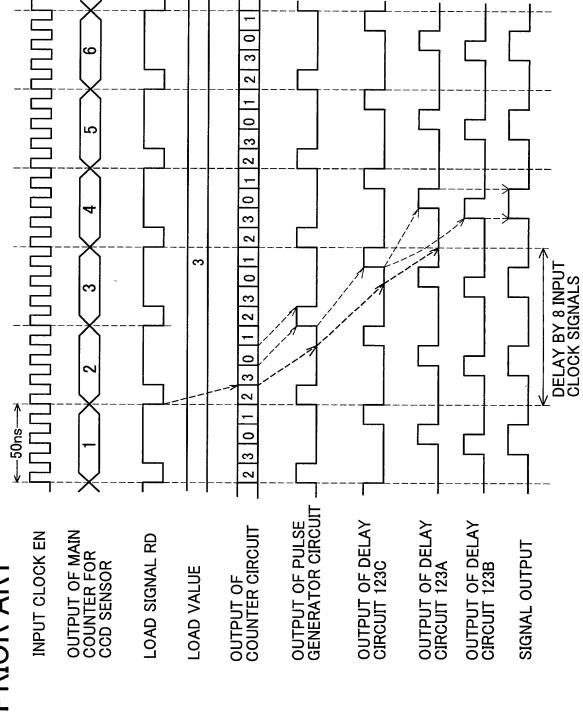


FIG. 30 PRIOR ART

